

OTHER CONTEMPORARIES OF MAN AND THE REINDEER AT MENTONE.¹

IN NATURE, October 10, 1907, appeared a notice of the stratigraphical and anthropological results obtained from the examination of the Baoussé-Raoussé caves at Mentone. In the work at present under review we obtain the no less important geological and palæontological results. It may be said at the outset that this subsequent volume is in every sense a worthy companion to the preceding volumes, which fulfilled in an exemplary manner the many tedious requirements which modern archæology exacts from those who undertake the investigation and description of these valuable and irreplaceable records of the past. Not the least part of the debt which archæologists owe to MM. Boule, Verneau, and de Villeneuve is due to the admirable methods which they have instituted.

The volume at present under review contains a full account of the various animal bones recovered from these caves. The bones of each animal are first care-

doubt laborious. Measurements of bones are almost entirely eschewed, M. Boule believing, with many others, that measurements arbitrarily chosen are in no way superior to simple observation, nor are they likely in his opinion to disclose such specific characters as would be likely to be hidden from the trained and experienced eye. Instead of long lists of measurements of dubious value, the text is enriched with a large number of admirable photographs, which in some respects possess an advantage over the actual specimens themselves.

The bones recovered were obtained from the Grottes du Prince, des Enfants, and du Cavillon. They comprised parts of the skeletons of the following:—*Elephas antiquus*, *Rhinoceros merckii*, *Equus caballus*, *Hippopotamus*, *Sus scrofa*, *Bos primigenius*, *Bison priscus*, *Cervus capreolus*, *Cervus elaphus*, *Cervus samonensis*, *Cervus tarandus*, *Cervus alces*, *Rupicapra tragus*, and *Capra ibex*.

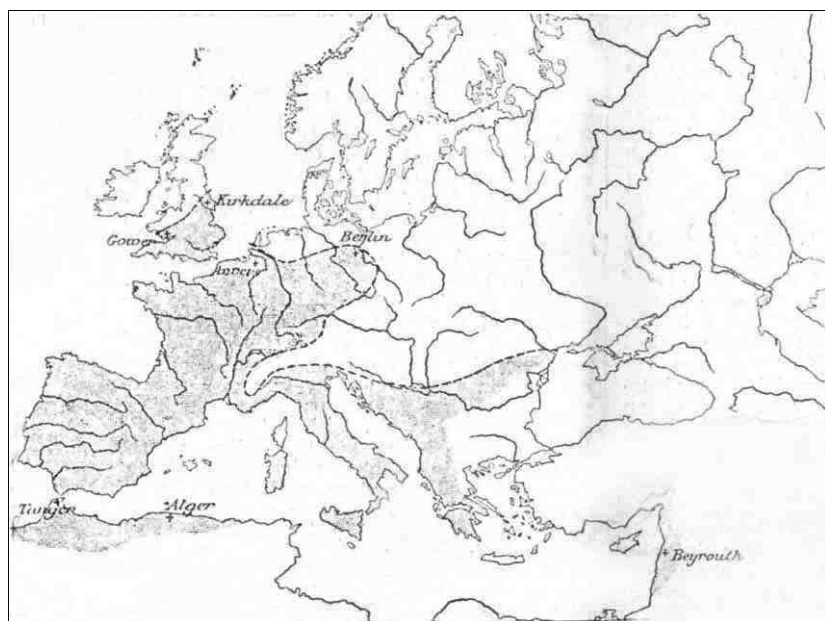
The presence of *Elephas primigenius* was uncertain; *Rhinoceros tichorhinus* was absent. The Equidæ were

represented by specimens which, though relatively few in number, were of wide distribution, being scattered through and recoverable from all the beds. M. Boule believes that he can recognise with considerable confidence the remains of *Equus asinus*. The vast majority of the specimens, however, belong to *Equus caballus* and to the subdivision of that species which has been variously named *Equus caballus*, Linn., *Equus caballus typicus* (Cossar Ewart), *Equus robustus* (Frank). Contrary to the expectations of those who have studied the carvings and engravings of the reindeer period, neither *Equus przewalskii* nor the zebra can be shown to have been present.

Pigs were abundant. In the Mentone neighbourhood *Bos primigenius* made its appearance quite as early as *Bison priscus*, if indeed not earlier. *Bos longifrons* was absent. *Cervus capreolus* was present as a vigorous form of the exist-

ing animal. *Cervus elaphus* and *Cervus samonensis* were considerably larger than modern specimens. *Cervus tarandus* made its appearance suddenly in Mid-Pleistocene deposits; it was only found in any numbers in the Grotte du Cavillon. *Rupicapra tragus* was of a vigorous type showing affinities to the chamois of the Alps and of the Pyrenees. *Capra ibex* was represented by such a large number of specimens that M. Boule hopes to see some day a complete reconstructed skeleton of this animal at the Musée d'Anthropologie de Monaco. He considers it to be the ancestor of the Alpine goat of to-day.

This most interesting and valuable volume will thus be seen to confirm the opinion which has slowly but surely ripened to a conclusion that there has been no sudden or complete break in the evolution or history of the fauna of western Europe from Palæolithic to Neolithic times. There has further been little if any natural organic evolution in the larger mammalia from the earliest Pleistocene to the present day. Some of the animals of the Pleistocene have disappeared through changes in climatic conditions or under the



Map showing the area from which the remains of *Elephas antiquus* have been reported.

fully considered, and so far as is possible a general idea is obtained of the animal as it is represented in the deposits within these caves. The information thus obtained is next checked, confirmed, and extended by comparing the Baoussé-Raoussé specimens with those contained in the various museums of Europe. A no less interesting comparison is then instituted between these extinct forms and the forms living at the present day. Attention is next directed to the exact stratigraphical position in which the bones were discovered, and from this evidence the order of arrival of the Pleistocene mammals in the Mentone district is deduced. Not content with this, M. Boule furnishes us with a series of most useful maps of Europe and the adjoining parts of Asia and Africa showing the areas from which the remains of some of the larger and more important animals have been reported. The methods employed will thus be seen to be as perfect and exhaustive as they were no

¹ "Les Grottes de Grimaldi" (Baoussé-Raoussé). Tome i., Fascicule iii., Géologie et Paléontologie (suite), by Prof. M. Boule. Pp 157-236+plates xiv-xxix. (Monaco, 1910.)

unrelenting hand of man; others have deteriorated in size and vigour as they have gradually come under the yoke. The horse, however, forms a notable exception, having from obvious reasons improved in physique and gained in strength. Such minor changes, changes of degree rather than of kind, are all that evolution can lay claim to have effected in these stubborn mammalia within the compass of some thousands of years during which Mentone has known the two extremes of climate and temperature.

Another great assistance rendered by the work of M. Boule is that he has enabled us with more certainty than was possible before to reconstruct the milieu of certain of our Palæolithic ancestors; for, from the fauna it is not difficult to realise the nature of the flora or the conditions of the climate. With the in-

THE TYPES OF WATER WAVES.¹

DR. CORNISH has produced an attractive and valuable book. The volume is not the less valuable in that it is primarily descriptive, and in that the author shows great caution and reserve as regards speculative explanations. This caution is indeed amply warranted. The mathematical theory of water waves, successful as it is up to a certain point, is limited in its application by the fact that it contemplates only specially simplified conditions. In particular, owing to the restriction to *small* amplitudes, it can at present offer little in the way of explanation of various important natural phenomena, where what is technically called "turbulent" motion comes into play. Laboratory experiments, on the other hand, require elaborate and costly arrangements, which are only provided with difficulty even when a definite



FIG. 1.—Wave-track of Steamer on Thunersee, showing thwart-ship and diverging waves. From "Waves of the Sea and other Water Waves."

formation thus obtained we can approach the stone and bone implements which the man of that remote date has left, and deduce more confidently what were the purposes they served. A knowledge of the fauna is thus seen to be the key which will most successfully unlock many of the sealed chambers of man's past. Apart, however, from all this, the study of the extinct Pleistocene fauna possesses in itself great and abiding interest, and dull must be the archæologist or anthropologist who does not desire further knowledge concerning these early companions of man whose bones lie commingled with his in river drift and cave floor.

The book is a most valuable contribution to science, and reflects the greatest credit on everyone concerned.

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practical problem is in view; and in some respects the mere question of scale would impair their relevancy. There remain only observations in the open, such as the author has recorded in the present book. The extreme difficulty of these, from a quantitative point of view, is well illustrated by his discussion of storm-waves at sea.

The book is made very readable by the fact that the author's interest in his subject is evidently æsthetic as well as practical or scientific. He is fascinated by the extraordinarily beautiful and varied types of wave motion which are presented by nature, and has recorded a number of these, observed at sea or on land in many parts of the world, in a series of remarkable photographs.

¹ "Waves of the Sea and other Water Waves." By Dr. Vaughan Cornish. Pp. 374. (London: T. Fisher Unwin, 1910.) Price 10s. net.